Amendments to the Claims:

1. (Withdrawn) A non-destructive method for determining an amount of heat exposure to a resin-fiber composite substrate, the method comprising:

non-destructively determining a value I_s of infrared energy reflected by a surface on a composite substrate; and

correlating the value I_s of the infrared energy reflected to an amount of heat exposure.

2. (Currently Amended) The method of Claim 10 ~~Claim 1~~, further comprising determining a value I_r of infrared energy reflected from a reference composite surface.

3. (Original) The method of Claim 2, further comprising comparing I_s with I_r.

4. (Currently Amended) The method of ~~Claim 1, wherein determining I_s includes utilizing an infrared spectrometer~~ Claim 19, wherein the second wavenumber is around 2000 cm-1.

5. (Currently Amended) The method of Claim 10 ~~Claim 4~~, wherein the infrared spectrometer includes an infrared filter spectrometer.

6. (Currently Amended) The method of Claim 10 ~~Claim 4~~, wherein the infrared spectrometer includes an ellipsoidal mirror collector.

7. (Currently Amended) The method of Claim 10 ~~Claim 4~~, wherein the infrared spectrometer includes an attenuated total reflectance collector.

8. (Currently Amended) The method of Claim 10 ~~Claim 4~~, wherein the infrared spectrometer includes at least two filters.

9. (Original) The method of Claim 8, wherein the at least two filters include narrow bandpass infrared filters.

10. (Currently Amended) ~~The method of Claim 1~~ A non-destructive method for determining an amount of heat exposure to a resin-fiber composite substrate, the method comprising:

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non-destructively determining a value I_s of infrared energy reflected by a surface on the composite substrate; and

correlating the value I_s of the infrared energy reflected to an amount of heat exposure, wherein determining I_s includes determining absorbance at at least one wavenumber ~~corresponding with~~ wherein increased infrared absorbance ~~by a composite exposed to heat~~ reflects exposure by the composite substrate to heat greater than 300 degrees F.

11. (Original) The method of Claim 10, wherein the at least one wavenumber is around 2174 cm-1.

12. (Withdrawn) The method of Claim 10, wherein the at least one wavenumber is around 2000 cm-1.

13. (Original) The method of Claim 10, wherein the at least one wavenumber is around 1783 cm-1.

14. (Original) The method of Claim 10, wherein the at least one wavenumber is around 1727 cm-1.

15. (Original) The method of Claim 10, wherein the at least one wavenumber is around 1767 cm-1.

16. (Original) The method of Claim 10, wherein the at least one wavenumber is around 1692 cm-1.

17. (Original) The method of Claim 10, wherein the at least one wavenumber is around 1678 cm-1.

18. (Original) The method of Claim 10, wherein the at least one wavenumber is around 1522 cm-1.

19. (Currently Amended) The method of Claim 10, wherein correlating the infrared absorbance to an amount of heat exposure of the sample includes determining a difference between infrared absorbance of the ~~sample~~ composite substrate at at least two wavenumbers, wherein absorbance at a second wavenumber is subtracted from absorbance from a first

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wavenumber, and a difference greater than a threshold amount reflects exposure of the composite substrate to heat greater than 300 degrees F .

20. (Currently Amended) The method of Claim 19, wherein ~~the at least two wavenumbers are~~ the first wavenumber is around 1522 cm-1 and the second wavenumber is around 1678 cm-1 and the theshold amount is approximately 0.07.

21. (Currently Amended) The method of Claim 19, wherein ~~the at least two wavenumbers are~~ the first wavenumber is around ~~1629 cm-1~~ 1692 cm-1 and the second wavenumber is around 2174 cm-1 and the theshold amount is greater than 0.15.

22. (Currently Amended) A non-destructive method for determining an amount of heat damage to a resin-fiber composite sample, the method comprising:

transmitting an infrared beam onto a sample of a resin-fiber composite, wherein transmitting an infrared beam includes transmitting the infrared beam in a direction approximately in alignment with fibers in the sample;

detecting a reflected infrared beam reflected by the sample;

determining infrared absorbance of the sample; and

correlating the infrared absorbance to an amount of heat damage to the sample.

23. (Withdrawn) The method of Claim 22, wherein transmitting an infrared beam includes transmitting the infrared beam in a direction approximately parallel with fibers in the sample.

24. (Original) The method of Claim 22, wherein determining the infrared absorbance includes using an infrared spectrometer.

25. (Currently Amended) The method of Claim 22, wherein correlating the infrared absorbance includes determining absorbance at at least one wavenumber ~~corresponding with an infrared spectra of a heat damaged resin fiber composite surface~~ wherein increased absorbance reflects exposure by the composite sample to heat greater than 300 degrees F.

26. (Original) The method of Claim 25, wherein the at least one wavenumber is around 2174 cm-1.

27. (Withdrawn) The method of Claim 25, wherein the at least one wavenumber is around 2000 cm-1.

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28. (Original) The method of Claim 25, wherein the at least one wavenumber is around 1783 cm-1.

29. (Original) The method of Claim 25, wherein the at least one wavenumber is around 1727 cm-1.

30. (Original) The method of Claim 25, wherein the at least one wavenumber is around 1767 cm-1.

31. (Original) The method of Claim 25, wherein the at least one wavenumber is around 1692 cm-1.

32. (Original) The method of Claim 25, wherein the at least one wavenumber is around 1678 cm-1.

33. (Original) The method of Claim 25, wherein the at least one wavenumber is around 1522 cm-1.

34. (Currently Amended) The method of ~~Claim 35~~ Claim 25, wherein correlating the infrared absorbance to an amount of heat damage of the sample includes deriving a difference between infrared absorbance at at least two wave numbers wherein absorbance at a second wavenumber is subtracted from absorbance from a first wavenumber, and a difference greater than a threshold amount reflects exposure by the composite substrate to heat greater than 300 degrees F.

35. (Currently Amended) The method of Claim 34, wherein deriving a difference between infrared absorbance of the sample at at least two wavenumbers includes deriving a difference between infrared absorbance at a first wavenumber of around 1522 cm-1 and at a second wave number of around 1678 cm-1.

36. (Currently Amended) The method of Claim 34, wherein deriving a difference between infrared absorbance of the sample at at least two wavenumbers includes deriving a difference between infrared absorbance at a first wavenumber of around 1692 cm-1 and at a second wave number of around 2174 cm-1.

37. (Currently Amended) The method of ~~Claim 22~~ Claim 25, wherein detecting a reflected infrared beam reflected by the sample includes filtering the reflected infrared beam.

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38. (Original) The method of Claim 37, wherein filtering the reflected infrared beam includes utilizing at least two filters.

39. (Cancelled)

40. (Withdrawn) The method of Claim 39, wherein correlating the first difference to a reference sample includes comparing the first difference with a second difference of infrared absorbance at the first wavenumber and the second wavenumber for the reference sample.

41. (Currently Amended) The method of Claim 47 ~~Claim 39~~, wherein determining at least one of the first infrared absorbance and the second infrared absorbance includes using an infrared filter spectrometer.

42. (Currently Amended) The method of ~~Claim 41, wherein the infrared spectrometer includes an infrared filter spectrometer~~ Claim 47, wherein the first wavenumber is around 1678 cm-1, the second wavenumber is around 2000 cm-1, and the first difference is greater than approximately 0.07.

43. (Currently Amended) The method of ~~Claim 42, wherein the infrared spectrometer includes at least two filters~~ Claim 47, wherein the first wavenumber is around 1767 cm-1, the second wavenumber is around 2000 cm-1, and the first difference is greater than approximately 0.04.

44. (Currently Amended) The method of ~~Claim 43, wherein the filters include narrow bandpass infrared filters~~ Claim 47, wherein the first wavenumber is around 2174 cm-1, the second wavenumber is around 2000 cm-1, and the first difference is less than approximately 0.015.

45. (Currently Amended) The method of ~~Claim 41, wherein the infrared spectrometer utilizes an ellipsoidal mirror~~. Claim 47, wherein the first wavenumber is around 1783 cm-1, the second wavenumber is around 2000 cm-1, and the first difference greater than approximately 0.04.

46. (Currently Amended) The method of ~~Claim 41, wherein the infrared spectrometer utilizes attenuated total reflectance~~ Claim 47, wherein the first wavenumber is around 1727 cm-

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1, the second wavenumber is around 2000 cm-1, and the first difference is greater than approximately 0.075.

47. (Currently Amended) ~~The method of Claim 39,~~ A non-destructive method for determining an amount of heat exposure of a resin-fiber composite sample, the method comprising:

transmitting an infrared beam onto a sample of resin-fiber composite;

detecting a reflected infrared beam reflected by the sample;

determining a first infrared absorbance of the sample from the reflected infrared beam at a first wavenumber, wherein the first wavenumber corresponds with an infrared spectra of a heat damaged composite surface;

determining a second infrared absorbance of the sample from the reflected infrared beam at a second wavenumber, and the second wavenumber ~~correspond~~ corresponds with an infrared spectra of a heat damaged composite surface;

deriving a first difference between the first infrared absorbance and the second infrared absorbance; and

quantitatively determining an amount of heat exposure by correlating the first difference to a plurality of reference samples exposed to various amounts of heat.

48. (Currently Amended) The method of Claim 47, wherein the first wavenumber is around 1522 cm-1, the second wavenumber is around 1678 cm-1, and the first difference is less than approximately 0.2.

49. (Withdrawn) The method of Claim 47, wherein the second wavenumber is around 1678 cm-1.

50. (Currently Amended) The method of Claim 47, wherein the first wavenumber is around 1692 cm-1, the second wavenumber is around 2174 cm-1, and the first difference is greater than approximately 0.15.

51. (Withdrawn) The method of Claim 47, wherein the second wavenumber is around 2174 cm-1.

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52. (Currently Amended) A non-destructive method for determining a degree of heat exposure of a resin-fiber composite substrate, the method comprising:

determining an alignment direction of fibers in the substrate

transmitting an infrared beam onto ~~an resin-fiber composite~~ the substrate in alignment with the alignment direction;

filtering with a first filter a reflected infrared beam reflected by the substrate;

detecting a first filtered portion of the reflected infrared beam; ~~and~~

determining a first infrared absorbance of the substrate, and;

correlating the first infrared absorbance to a degree of heat exposure by comparison to a plurality of reference samples exposed to various amounts of heat, including at least one reference sample exposed to temperatures over 300 degrees F.

53. (Cancelled)

54. (Original) The method of claim 52 wherein determining a first infrared absorbance includes determining absorbance at a wavenumber of around 2174 cm-1.

55. (Original) The method of claim 52 wherein determining a first infrared absorbance includes determining absorbance at a wavenumber of around 2000 cm-1.

56. (Original) The method of claim 52 wherein determining a first infrared absorbance includes determining absorbance at a wavenumber of around 1783 cm-1.

57. (Original) The method of claim 52 wherein determining a first infrared absorbance includes determining absorbance at a wavenumber of around 1727 cm-1.

58. (Original) The method of claim 52 wherein determining a first infrared absorbance includes determining absorbance at a wavenumber of around 1767 cm-1.

59. (Original) The method of claim 52 wherein determining a first infrared absorbance includes determining absorbance at a wavenumber of around 1692 cm-1.

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60. (Original) The method of claim 52 wherein determining a first infrared absorbance includes determining absorbance at a wavenumber of around 1678 cm-1.

61. (Original) The method of claim 52 wherein determining a first infrared absorbance includes determining absorbance at a wavenumber of around 1522 cm-1.

62. (Original) The method of Claim 52, further comprising:
filtering with a second filter a reflected infrared beam reflected by the substrate;
detecting a second filtered portion of the reflected infrared beam; and
determining a second infrared absorbance of the substrate.

63. (Original) The method of Claim 62, further comprising subtracting the second infrared absorbance from the first infrared absorbance.

64. (Original) The method of claim 62 wherein determining a first infrared absorbance includes determining absorbance at a wavenumber of around 1522 cm-1, and determining a second infrared absorbance includes determining absorbance at a wavenumber of around 1678 cm-1.

65. (Original) The method of claim 62 wherein determining a first infrared absorbance includes determining absorbance at a wavenumber of around 1692 cm-1, and determining a second infrared absorbance includes determining absorbance at a wavenumber of around 2174 cm-1.

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